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目的

針保持

特徴

針を差込む変形した
三角形の空洞形状を有する

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Description

1. Field of the Invention

This invention relates to a needle park for securing needles, and, more particularly, to a needle park for a package that holds one or more surgical needles and sutures.

2. Description of the Related Art

Packages for surgical needles and sutures must, among other things, securely anchor the needles, yet permit them to be easily removed when they are to be used. A simple holder device (i.e., needle park) for accomplishing that consists of a foam strip adhered to the base of the package. The needle either pierces the foam or is inserted into a slit cut into the foam. A disadvantage of the foam strip is that it is a separate element from the rest of the package and must be adhered to the base of the package, requiring an additional operation during package manufacture.

U.S. Patent 4,961,498, issued October 9, 1990, to Kalinski et al. discloses an alternate needle park comprising a molded post and adjacent molded rail, which may both be formed on the floor of a suture package. The post and rail are separated by a distance that is slightly smaller than the diameter of a needle to be held. When the needle is placed between the post and rail, the rail flexes slightly, and the needle is held in place by contact on either side of the needle with the post and the rail. This design is limited to holding needles of a single diameter. A somewhat similar needle park, which can hold a narrow range of needle diameters, is disclosed in U.S. Patent 4,424,898.

A needle park adapted to hold needles having a broad range of diameters consists of a raised platform that has two string-like lengths arrayed parallel to each other, with their ends affixed to the platform. The strings have notched undersides and the platform is open below the strings. Needles are parked by insertion on top of the platform and under the strings. The notches on the strings prevent the needles from sliding along the length of the strings. This type of park can retain needles having a range of diameters; however, it depends on the flexibility of the strings and is not as simple or inexpensive to manufacture as are other needle parks.

U.S. Patent 4,967,902, issued November 6, 1990 to Sobel et al. discloses another type of needle park, comprising a wall that extends upward from the base of a needle package and that is interrupted by a gap into which the needle may be inserted. That type of park can only hold a needle whose diameter is substantially the same as the

width of the gap between the wall ends. To increase the range of needle diameters that can be held, the wall ends can be undercut near the base and the base beneath the gap can be removed, which permits the wall ends to flex and bend, thereby accommodating a somewhat wider range of needle diameters. The range of needle diameters that can be held securely is limited, however.

This document discloses a needle park according to the preamble of claim 1.

U.S. Patent 4,573,575 shows a plastic needle package including needle accommodating compartments to accommodate and retain needle heads with different diameters. This is achieved by adjusting locally impressions in partition and side walls to the relevant needle head diameters so that nose-shaped protrusions of material that form projecting stops can be adjusted to the type of needle to be packaged. This adjustment is accomplished in using a soft plastic.

Summary of the Invention

In accordance with the present invention the needle park comprises the features as defined in claim 1.

Further advantageous embodiments of the inventive needle park are defined in the following dependent claims.

The needle park of the present invention is adapted for being molded as part of a needle and suture package which permits the packages to be made simply and inexpensively. At the same time, a single park can hold securely a needle whose diameter may vary over a broad range.

Brief Description of the Drawings

Fig. 1 depicts a surgical needle and suture package of the present invention.

Fig. 2 is an isometric view of a needle park of the present invention.

Fig. 3 shows a needle secured in the needle park of Fig. 2.

Fig. 4 shows a needle secured in a needle park of another embodiment of this invention.

Detailed Description of the Invention

The needle park of the present invention is adapted to securely anchor a surgical needle whose diameter is anywhere within a broad range of diameters. The needle park is typically part of a needle and suture package, and it does not unduly interfere with removal of the needle from the package. At the same time, the needle park is economical to manufacture. Thus, a suture package using this needle park can be manufactured by molding,

stamping, or thermoforming of thermoplastic materials.

Fig. 1 is a plan view of a one-piece needle and suture package of the present invention. The package 10 includes a central floor area 18 which is surrounded by an outer oval channel 12 having two opposing straight sections connected by two semi-circular end sections. The channel is defined by an inner wall 14 which extends upwardly from the floor area. The bottom and outer periphery of the channel 12 is defined by a curved section 16 of the package, which extends outwardly from the inner wall 14 at the level of the floor 18 and curves upwardly to approximately the elevation of the inner wall 14. Attached at the outer periphery of the curved section 16 are a plurality of hinged doors 20. The doors are hinged at an elevation which is slightly below the uppermost elevation of the outer periphery of the curved section and the inner wall so that, when the doors are folded over the channel and latched in place, the upper surfaces of the doors will align with the upper elevation of the outer periphery and inner wall. Formed in each door is a portion of the door locking means 24, including a latch opening 26 bounded by a door latch projection 28 and two fins 36. When the door is closed over channel 12, the top of the latch post 30 engages the door latch opening 26 and the door latch projection 28 hooks around the latch post projection 32 to lock the door in the closed position.

Located inside the oval channel is a needle park, an enlarged view of which appears in Fig. 2 and is described below. Adjacent the needle park is a relief flap 50 defined by a cutout 52. A portion of the inner wall 14 is eliminated in the vicinity of the needle park to form a vent 40 in the channel wall through which the suture of the needle accesses the channel between doors 20' and 20".

The bottom of the channel 12 formed by the curved section 16 is periodically perforated by holes 80 and 82 around the circumference of the channel. These holes are used for assembling the package with a suture and, optionally, a needle, as follows: Package 10 is placed on an assembly platform that has a number of upwardly extending pins. Two of the pins are aligned to extend upward through holes 66 and 68 in the center of the package to retain the package in its assembly position on the platform. Eight other pins extend upward and are aligned to pass through the holes 82 of the channel. The platform is open beneath the remaining channel holes 80 and a vacuum source below the platform draws air through the holes 80. With the package so emplaced, the needle is located in the needle holder, and the suture is looped above the pin extending through hole 66 then downward through the vent 40 and into the

channel. The suture is then wound in a clockwise direction around the pins which extend through the channel holes 82.

Additional details regarding the construction of the suture package of Fig. 1 appear in U.S. Patent 4,967,902, incorporated herein by reference.

Fig. 2 shows an enlarged isometric view of needle park 54. The needle park includes a first wall 55 and a second wall 56, both generally perpendicular to the floor 18 and separated by a gap 57. Cutout 58 separates end section 59 from base 18 and separates all but a top segment of end section 59 from the rest of wall 55. Preferably the upper surface of the top segment and the top of wall 56, on the opposite side of gap 57, are tapered to guide a needle.

In the embodiment shown, the separation of end section 59 from base 18 is a result of extending cutout 58 downward to include the region of base 18 that lies between walls 55 and 56. In an alternative embodiment, base 18 remains intact, but the bottom of end section 59 is cut off. The embodiment shown, with the cutout including a portion of the base, is preferred, because it is easier to form by molding, a preferred method of fabricating package 10.

The facing surfaces of walls 55 and 56 preferably have complementary shapes that maintain substantially constant separation over their surfaces. In the embodiment of Fig. 2, the facing surface of wall 55 has a "V"-shaped groove 60 that runs vertically from the top to the bottom of the wall, and the facing surface of wall 56 has a complementary top-to-bottom extension 61. An advantage of providing non-planar complementary faces on the adjoining surfaces of the walls is that a very small effective separation (essentially zero) can be achieved, which, in turn, permits very thin needles to be held. Furthermore, the "3-point contact" (to the needle) that is provided by the facing surfaces of Fig. 2 helps to prevent a needle from sliding in the needle park. Needle sliding can be a particular problem when there are closely adjoining needle parks - as shown in Fig. 1. In that case, sliding can cause the needles in adjoining parks to come into contact with each other, which is undesirable.

Fig. 3 shows part of a needle 62 being held in a needle park of the type shown in Fig. 2. The top segment of end section 59 has become a pivot point and the bottom of end section 59 has been bent into cutout 58 to accommodate needle 62. The substantially fixed top segment and flexible bottom of end section 59 combine to provide an "undercut" that minimizes the risk of the needle inadvertently backing out of the needle park. For holding very-small-diameter needles, the floor area 63 that supports the needle on opposite sides of gap 57 may be slightly raised, as shown in Figs. 2

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and 3, to prevent the needle from sliding between floor 18 and the bottom of end section 59.

Fig. 4 shows another embodiment of a needle park of this invention, particularly adapted for holding large-diameter needles. In this embodiment, the second wall 56 also has a cutout 58A. As a result, both walls have end sections with a top segment that provides a pivot point and a bottom that bends into a cutout. Compared to the embodiment shown in Fig. 3, the two-cutout structure is more symmetrical, and thus permits the hinge formed by the top of the end section to be stiffer.

The material of package 10 and of needle park 54 is preferably a moldable thermoplastic. Polypropylene is preferred, because of its flexibility, moldability, and ability to form a "living hinge" at end section 59. The dimensions of the elements of the needle park - e.g., gap width, size of cutout, dimensions of the groove and extension on the adjoining surfaces of the walls, etc. - are determined by the range of dimensions of the needles to be held and the mechanical characteristics of the needle park material - e.g., strength, flex modulus, memory, etc.

The invention having been described in specific detail and the manner in which it may be carried out having been exemplified, it will be readily apparent to those skilled in the art that innumerable variations, applications, modifications, and extensions of the basic principles involved may be made without departing from the scope of the invention.

Claims

1. A needle park (54) for securing a needle (62), comprising a generally planar base (18) on which is a first wall (55) and a second wall (56), generally perpendicular to the base (18) and collinear aligned, said first wall (55) and said second wall (56) having a first end section (59) and a second end section, respectively which are adjacent to each other and said first wall (55) having near said first end section (59) thereof a cutout (58) that separates said first end section (59) of said first wall (55) from the base (18),
characterized in that
~~said cutout (58) separates all but a top segment of said first end section (59) from the rest of said first wall (55), the top segment forming a pivot point around which a bottom part of said first end section (59) due to the flexible needle park material is able to flex into the cutout (58), whereby the needle (62) may be secured between said first end section (59) of said first wall (55) and said second end section of said second wall (56).~~

2. The needle park of claim 1 in which said end section (59) of said first wall (55) and said second end section of said second wall (56) have adjoining facing surfaces that have complementary shapes, with substantially constant separation over said surfaces.
3. The needle park of claim 2 in which said facing surface of said first end section (59) of said first wall (55) has a generally vertical groove (60) that generally extends from the top of the surface to the bottom and that adjoins a generally top-to-bottom extending projection (61) on said facing surface of said first end section of the second wall (56).
4. The needle park of any of the preceding claims in which said base (18) is cut away in the region below and between said first and second walls (59, 60).
5. The needle park of any of the preceding claims in which said material of the park comprises a moldable thermoplastic.
6. The needle park of claim 5 in which said material of the park is polypropylene.
7. A package for a surgical needle and suture, comprising the needle park of any of the preceding claims.
8. The needle park of any of the preceding claims in which said second wall (56) has a cutout (58A) as well that separates said second end section of said second wall (56) from said base (18) and separates all but a top segment of said second end section from the rest of said second wall (56), whereby said needle (62) may be secured in the gap (57) between said end sections (59).

Patentansprüche

1. Nadelanordnung (54) zum Befestigen einer Nadel (62), umfassend eine im allgemeinen ebene Basis (18), auf der eine erste Wand (55) und eine zweite Wand (56) vorgesehen sind, die allgemein senkrecht zu der Basis (18) und gleichgerichtet angeordnet sind, wobei die erste Wand (55) und die zweite Wand (56) einen ersten Endabschnitt (59) bzw. einen zweiten Endabschnitt aufweisen, die einander benachbart sind, wobei die erste Wand (55) in der Nähe des ersten Endabschnitts (59) derselben einen Ausschnitt (58) aufweist, der den ersten Endabschnitt (59) der ersten Wand (55) von der Basis (18) trennt,

dadurch gekennzeichnet, daß der Ausschnitt (58) alles, außer ein oberes Segment des ersten Endabschnitts (59), von dem Rest der ersten Wand (55) trennt, wobei das obere Segment einen Schwenkpunkt bildet, um den ein Bodenteil des ersten Endabschnitts (59) aufgrund des flexiblen Materials der Nadelanordnung in der Lage ist, sich in den Ausschnitt (58) zu biegen, wodurch die Nadel (62) zwischen dem ersten Endabschnitt (59) der ersten Wand (55) und dem zweiten Endabschnitt der zweiten Wand (56) befestigt werden kann.

2. Nadelanordnung nach Anspruch 1, bei der der Endabschnitt (59) der ersten Wand (55) und der zweite Endabschnitt der zweiten Wand (56) benachbarte Stirnflächen aufweisen, die einander entsprechende Formen mit einer im wesentlichen konstanten Trennung über die genannten Flächen haben. 15
3. Nadelanordnung nach Anspruch 2, bei der die Stirnfläche des ersten Endabschnitts (59) der ersten Wand (55) eine im allgemeinen senkrechte Nut (60) aufweist, die sich im allgemeinen von der Oberseite der Fläche zu dem Boden erstreckt und die an einen sich im allgemeinen von der Oberseite zum Boden erstreckenden Vorsprung (61) auf der Stirnfläche des ersten Endabschnitts der zweiten Wand (56) angrenzt. 25
4. Nadelanordnung nach einem der vorhergehenden Ansprüche, bei der die Basis (18) in dem Bereich unter und zwischen der ersten und zweiten Wand (59, 60) ausgeschnitten ist. 30
5. Nadelanordnung nach einem der vorhergehenden Ansprüche, bei der das Material der Anordnung ein verformbares thermoplastisches Material umfaßt. 40
6. Nadelanordnung nach Anspruch 5, bei der das Material der Anordnung Polypropylen ist. 45
7. Packung für ein chirurgisches Nadel-Nahtmaterial, umfassend die Nadelanordnung nach einem der vorhergehenden Ansprüche. 50
8. Nadelanordnung nach einem der vorhergehenden Ansprüche, bei der die zweite Wand (56) ebenfalls einen Ausschnitt (58A) hat, der den zweiten Endabschnitt der zweiten Wand (56) von der Basis (18) trennt und mit Ausnahme eines oberen Segmentes des zweiten Endabschnitts von dem Rest der zweiten Wand (56) trennt, wodurch die Nadel (62) in dem Spalt 55

(57) zwischen den Endabschnitten (59) befestigt werden kann.

Revendications

1. Parc d'aiguille (54) pour fixer une aiguille (62) comprenant une base généralement plane (18) sur laquelle se trouve une première paroi (55) et une deuxième paroi (56), généralement perpendiculaires à la base (18) et alignées colinéairement, ladite première paroi (55) et ladite seconde paroi (56) ayant une première section d'extrémité (59) et une deuxième section d'extrémité, respectivement, qui sont adjacentes l'une à l'autre et ladite première paroi (55) ayant près de ladite première section d'extrémité (59) de celle-ci une lumière (58) qui sépare ladite première section d'extrémité (59) de ladite première paroi (55) à partir de la base (18), caractérisé en ce que ladite lumière (58) sépare tout sauf un segment supérieur de la première section d'extrémité (59) à partir du reste de ladite première paroi (55), le segment supérieur formant un point de pivot autour duquel une partie inférieure de ladite première section d'extrémité (59) du fait de la matière flexible du parc d'aiguille est capable de se fléchir dans la lumière (58), ainsi l'aiguille (62) peut être fixée entre ladite première section d'extrémité (59) de ladite première paroi (55) et ladite seconde section d'extrémité de ladite seconde paroi (56). 5
2. Parc d'aiguille selon la revendication 1, dans lequel la section d'extrémité (59) de ladite première paroi (55) et ladite seconde section d'extrémité de ladite seconde paroi (56) possèdent des surfaces contiguës de contact usinées qui ont des formes complémentaires, avec une séparation sensiblement constante le long des dites surfaces. 10
3. Parc d'aiguille selon la revendication 2, dans lequel ladite surface de contact usinée de ladite première section d'extrémité (59) de ladite première paroi (55) possède une rainure généralement verticale (60) qui s'étend généralement du haut de la surface au bas et qui est contiguë à une projection (61) s'étendant généralement du haut vers le bas sur ladite surface faisant face de ladite première section d'extrémité de la seconde paroi (56). 15
4. Parc d'aiguille selon l'une quelconque des revendications précédentes, dans lequel ladite base (18) est découpée dans la région au 20

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dessous et entre lesdites première et seconde parois (59, 60).

5. Parc d'aiguille selon l'une quelconque des revendications précédentes, dans lequel ladite matière du parc comprend une matière thermoplastique moulable. 5
6. Parc d'aiguille selon la revendication 5, dans lequel ladite matière du parc est le polypropylène. 10
7. Emballage pour une aiguille chirurgicale et une suture, comprenant le parc d'aiguille selon l'une quelconque des revendications précédentes. 15
8. Parc d'aiguille selon l'une quelconque des revendications précédentes, dans lequel ladite seconde paroi (56) possède une lumière (58A) qui sépare ainsi ladite deuxième section d'extrémité de ladite seconde paroi (56) d'avec ladite base (18) et qui sépare tout sauf un segment supérieur de ladite seconde section d'extrémité du reste de ladite seconde paroi (56), ainsi ladite aiguille (62) peut être fixée dans l'intervalle (57) entre lesdites sections d'extrémité (59). 20
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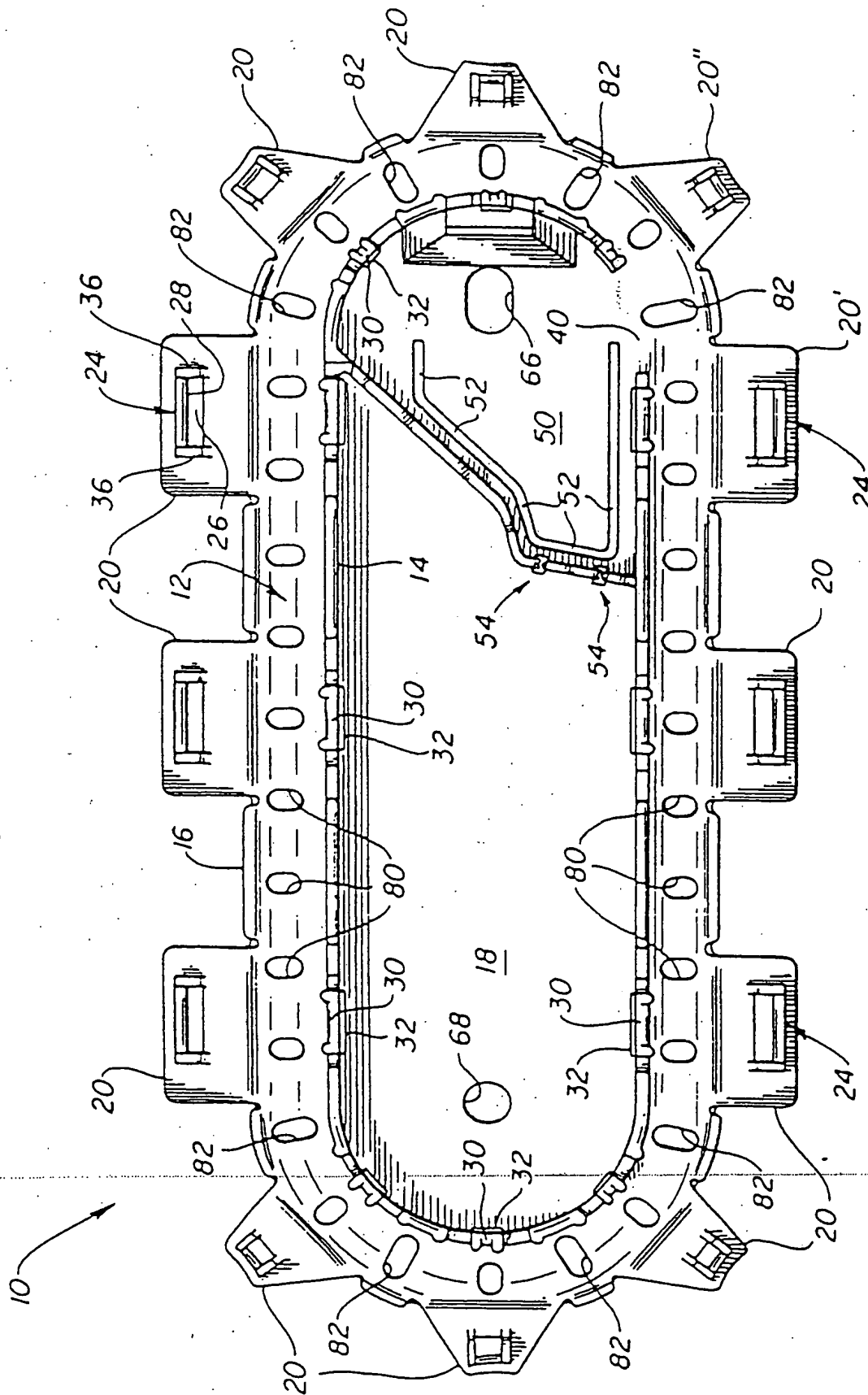
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FIG-1



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FIG. 2

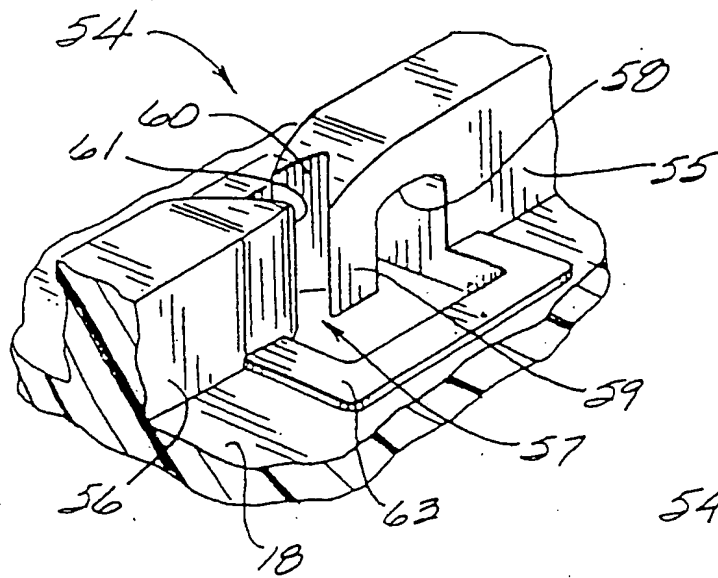


FIG. 3

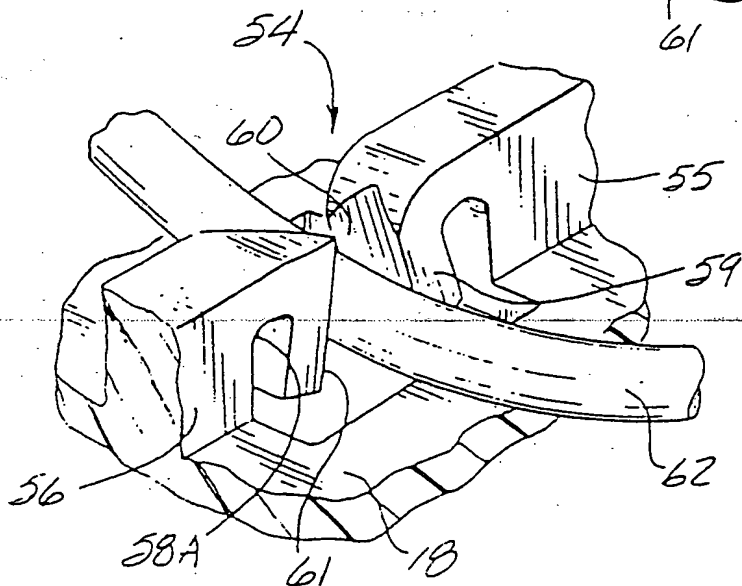
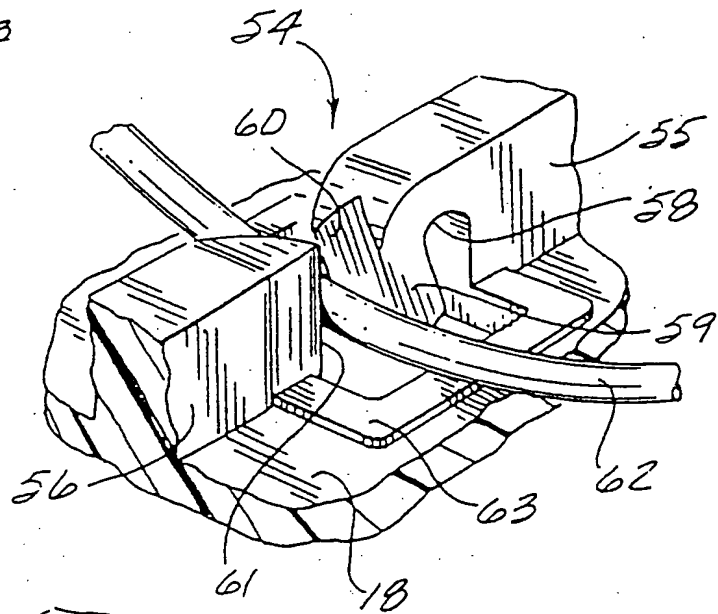


FIG. 4